In the Claims

1. (Currently Amended) A ~~M~~method for damping a torsional oscillation in a rotating drive train having at least one electrical machine, ~~(13, 72, 82), the electrical machine (13, 72, 82)~~ comprising the step of

- applying a damping torque with the electrical machine to the drive train, ~~characterized in that~~ wherein the damping torque is applied at a predetermined damping frequency and antiphase to an angular velocity of the torsional oscillation.

2. (Currently Amended) The ~~M~~method according to claim 1, ~~characterized in that~~ wherein the predetermined damping frequency essentially corresponds to a resonant frequency of the drive train.

3. (Currently Amended) The ~~M~~method according to claim 1, ~~characterized in that~~ wherein the torsional oscillation of the drive train without the damping torque applied has a quality factor of more than 500.

4. (Currently Amended) The ~~M~~method according to claim 1, ~~characterized in that~~ wherein the quality factor with the damping torque applied lies below 200.

5. (Currently Amended) The ~~M~~method according to ~~any one of the preceding claims~~ claim 1, ~~characterized by~~ further comprising the ~~following~~ steps of:

- determining ~~determination of~~ at least one control variable ~~(33, 33')~~, which represents a torsional loading at at least one site in the drive train, and

- controlling ~~control of~~ the damping torque depending on the control variable ~~(33, 33')~~ in a control circuit.

6. (Currently Amended) The ~~M~~method according to claim 5, ~~characterized in that~~ wherein the control variable ~~(33, 33')~~ is determined from a measurement signal from one or more sensors ~~(14, 14')~~.

7. (Currently Amended) The ~~M~~method according to claim 6, ~~characterized in that~~ wherein the sensors are at least one of azimuthally and~~/or~~ axially spaced from one another in relation to the drive train.

8. (Currently Amended) The ~~M~~method according to claim 6 ~~or 7~~, ~~characterized in that~~ wherein at least one of the sensors ~~(14, 14')~~ is a magnetostrictive sensor, ~~and/or~~ a strain gauge ~~and/~~or a sensor for angular velocity measurement.

9. (Currently Amended) The ~~M~~method according to ~~at least one of~~ claim~~s~~ 5 ~~to 8~~, ~~characterized in that~~ wherein a feedback variable is derived from the control variable ~~(33, 33')~~, in that the control variable ~~(33, 33')~~ is filtered, phase-shifted and inverted, the overall phase shift in the control circuit substantially amounting to 90°, the feedback variable representing the angular velocity produced by the torsional oscillation at the resonant frequency.

10. (Currently Amended) The ~~M~~method according to ~~at least one of the preceding claims characterized in that~~ claim 1, wherein for applying the damping torque, energy is temporarily stored in a direct current circuit with a direct current component and an alternating current component, the temporarily stored energy

being taken from an alternating current circuit ~~(31)~~ to which the electrical machine ~~(13, 72, 82)~~ is connected.

11. (Currently Amended) The ~~M~~method according to claim 10, ~~characterized in that~~ wherein the energy is temporarily stored with at least one coil ~~(41)~~ in the direct current circuit.

12. (Currently Amended) The ~~M~~method according to claim 10 ~~or 11, characterized in that~~ wherein the energy is temporarily stored with at least one capacitor ~~(41')~~ in the direct current circuit.

13. (Currently Amended) The ~~M~~method according to ~~at least one of claims 10 to 12~~ claim 10, ~~characterized by~~ further comprising the following steps:

- providing a target value ~~(32, 32')~~ for current control or voltage control of the direct current circuit from the direct current component and the alternating current component, the alternating current component representing the feedback variable and having a frequency which substantially corresponds to the resonant frequency, and
- controlling the direct current circuit with the target value via a current converter ~~(42, 42')~~ connected to the alternating current circuit ~~(31)~~, effective power being brought about in the electrical machine ~~(13, 72, 82)~~ via the alternating current circuit ~~(31)~~.

14. (Currently Amended) The ~~M~~method according to claim 13, ~~characterized in that~~ wherein the damping power is adjusted via the size of the direct current component, ~~and/or~~ the size of the alternating current component or both.

15. (Currently Amended) The ~~M~~method according to claim 13, ~~or 14, characterized in that~~ wherein a maximum of 5% of the power converted by the electrical machine ~~(13, 72, 82)~~ is used via the current converter ~~(42, 42')~~ for damping the torsional oscillation.

16. (Currently Amended) The ~~M~~method according to ~~at least one of the preceding claims, characterized in that~~ claim 1, wherein the overall mass of the rotating components of the drive train is more than 20 tons.

17. (Currently Amended) The ~~M~~method according to ~~at least one of the preceding claims, characterized in that~~ claim 1, wherein the torsional oscillation of at least one further drive train which has at least one further electrical machine is damped, wherein the drive trains having different resonant frequencies.

18. (Currently Amended) The ~~M~~method according to ~~at least one of the preceding claims, characterized in that~~ claim 1, wherein the electrical machine ~~(13, 72, 82)~~ is a synchronous machine.

19. (Currently Amended) The ~~M~~method according to ~~at least one of claims 10 to 18, characterized in that~~ claim 10, wherein current flows in the direct current circuit only on occurrence of the torsional oscillation in the drive train.

20. (Currently Amended) The ~~M~~method according to ~~at least one of the preceding claims, characterized in that~~ claim 1, wherein a plurality of torsional oscillations with different frequencies of the rotating drive train are damped, the damping torque containing damping frequency components with predetermined damping frequencies and the damping frequency components being

each antiphase to the angular velocity of the corresponding torsional oscillation.

21. (Currently Amended) The ~~M~~method according to claim 20, ~~characterized in that~~ wherein the predetermined damping frequencies substantially correspond to resonant frequencies of the drive train.

22. (Currently Amended) The ~~M~~method according to claim 20, ~~or 21, characterized by~~ further comprising the following steps:
determining ~~determination of~~ a plurality of control variables ~~(33, 33')~~
providing a plurality of feedback variables from the control variables ~~(33, 33')~~ for the torsional oscillations, each feedback variable having a frequency that is substantially equal to the frequency of the corresponding torsional oscillations,
providing the target value ~~(32, 32')~~ for current control or voltage control of the direct current circuit from the direct current component and the alternating current component, the alternating current component representing the sum of the feedback variables, and
controlling the direct current circuit with the target value via the current converter ~~(42, 42')~~ connected to the alternating current circuit ~~(31)~~, effective power being brought about in the electrical machine ~~(13, 72, 82)~~ via the alternating current circuit ~~(31)~~.

23. (Currently Amended) A ~~D~~damping device for damping a torsional oscillation in a rotating drive train having an electrical machine ~~(13, 72, 82)~~ and an electrical multipole ~~(31)~~ connected to the electrical machine ~~(13, 72, 82), where~~

the damping device ~~may be~~ being connected via the electrical multipole ~~(31)~~ to the electrical machine ~~(13, 72, 82)~~ and being arranged for generating a damping torque in the electrical machine ~~(13, 72, 82)~~, ~~characterized in that~~ wherein the damping torque has a predetermined damping frequency and is antiphase to the angular velocity of the torsional oscillation.

24. (Currently Amended) The ~~D~~damping device according to claim 23, ~~characterized in that~~ wherein the predetermined damping frequency substantially corresponds to a resonant frequency of the drive train.

25. (Currently Amended) The ~~D~~damping device according to claim 23 ~~or 24, characterized in that~~ wherein the torsional oscillation of the drive train without the damping torque applied has a quality factor of more than 500.

26. (Currently Amended) The ~~D~~damping device according to claim 25, ~~characterized in that~~ wherein the quality factor with the damping torque applied lies below 200.

27. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 23 to 26, characterized by~~ claim 23, further comprising a controller, which controls the strength of the damping torque depending on a control variable ~~(33, 33')~~.

28. (Currently Amended) The ~~D~~damping device according to claim 27, ~~characterized by~~ further comprising measuring equipment and at least one sensor ~~(14, 14')~~ for determining the control variable ~~(33, 33')~~, the measuring equipment being linked on the input side to the sensor ~~(14, 14')~~.

29. (Currently Amended) The ~~D~~damping device according to claim 28, ~~characterized in that~~ wherein a plurality of sensors are provided, which are azimuthally ~~and/~~or axially spaced from one another in relation to the drive train.

30. (Currently Amended) The ~~D~~damping device according to claim 28, ~~or 29, characterized in that~~ wherein the at least one sensor ~~(14, 14')~~ is a magnetostrictive sensor ~~and/~~or a strain gauge ~~and/~~or an angular velocity sensor.

31. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 28 to 30, characterized in that~~ claim 28, wherein the measuring equipment has at least one of a filter ~~(61)~~, which is tuned to the resonant frequency, a phase-shifter ~~(62)~~ and~~/or~~ an inverter ~~(63)~~ for creating a feedback variable, the feedback variable being an oscillating signal at the damping frequency.

32. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 28 to 31, characterized by~~ claim 23, further comprising an energy storage for intermediate storage of energy, the energy being drawn from the electrical machine ~~(13, 72, 82)~~ or the multipole ~~(31)~~.

33. (Currently Amended) The ~~D~~damping device according to claim 32, ~~characterized in that~~ wherein the energy storage has at least one coil ~~(41)~~, which is arranged in a direct current circuit with an alternating current component.

34. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 32 to 33, characterized by~~ claim 32 further comprising a current converter ~~(42, 42')~~, via which the energy

storage is connectable to the multipole ~~(31)~~ under current control or voltage control.

35. (Currently Amended) The ~~D~~damping device according to claim 34, ~~characterized in that~~ wherein the energy storage has at least one capacitor ~~(41')~~, which is arranged on the direct current side of the current converter ~~(42, 42')~~.

36. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 32 to 35, characterized in that~~ claim 32, wherein the controller has an adder ~~(65)~~ with two inputs, whose one input is connected to the measuring equipment which outputs the feedback variable and to whose other input a direct current component to be added is applied, the output issuing a target value ~~(32, 32')~~ for a control system ~~(50)~~ of the current converter ~~(42, 42')~~.

37. (Currently Amended) The ~~D~~damping device according to claim 36, ~~characterized in that~~ wherein the damping power is controllable in that in the controller the amplification factor of the feedback variable and the size of the direct current component are controllable.

38. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 35 to 37, characterized in that~~ claim 35, wherein the current converter ~~(42, 42')~~ controls a maximum power level of 5% of the power converted by the electrical machine ~~(13, 72, 82)~~.

39. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 23 to 38, characterized in that~~ claim 23, wherein the drive train has an overall mass of over 20 tons.

40. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 23 to 39, characterized in that~~ claim 23, wherein one control module and a plurality of power modules are provided, where the power modules can be controlled in parallel by the control module in order to achieve a larger damping power.

41. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 23 to 40, characterized in that~~ claim 23, wherein the electrical machine ~~(13, 72, 82)~~ is a synchronous machine.

42. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 33 to 41, characterized in that~~ claim 33, wherein the direct current circuit is current-free when no torsional oscillation occurs.

43. (Currently Amended) The ~~D~~damping device according to ~~at least one of claims 28 to 42, characterized by~~ claim 28, further comprising a plurality of measuring equipment~~s~~ with which feedback variables may be determined for various torsional oscillations of the drive train at different frequencies and which are connected to the one or the plurality of sensors ~~(14, 14')~~.

44. (Currently Amended) The ~~D~~damping device according to claim 43, ~~characterized in that~~ wherein the plurality of sensors ~~(14, 14')~~ are arranged at sites on the drive train at which the deformations caused by the torsional oscillations are maximal.

45. (Currently Amended) The ~~D~~damping device according to claim 43, ~~or 44, characterized by~~ further comprising a feedback variable adder ~~(67)~~, which adds the feedback variables output by the measuring equipment~~s~~ and whose output is linked to the input of the adder ~~(65)~~ of the controller.

46. (Canceled)

47. (New) A method of using a damping device according to claim 23 for damping a torsional oscillation in a drive train of a turbine or wind power generator, a ship drive system, a helicopter drive system or a lift drive system or in an upright shaft.